AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all listings and prior versions of the claims in this application.

Listing of the Claims:

1. (Currently amended) A method of transforming energy in a rotary screw machine ~~(Fig. 1a),~~ which comprises:

a first set of conjugated male and female elements; ~~(5, 6, 7; 15, 16, 17)~~ and

at least a second set of conjugated male and female elements ~~(8, 9; 5', 6', 7'; 15', 16', 17'),~~ spaced apart from said first set ~~(1)~~ along a central axis of said machine, ~~wherein~~ said female elements ~~(5, 6, 15, 16; 8; 5', 6', 15', 16')~~ of each set ~~have~~ having an inner profiled surface ~~(105, 106, 115, 116; 108; 105', 106', 115', 116')~~ centered about a first longitudinal axis, ~~(Z) and wherein~~ said male elements ~~(6, 7, 16, 17; 9; 6', 7', 16', 17')~~ of each set ~~(1, 2, 3) have~~ having an outer profiled surface ~~(206, 207, 216, 217; 209; 206', 207', 216', 217') centred~~ centered about a second longitudinal axis, [[-]] said first axis and said second axis being parallel to each other, and [[-]] said male elements being placed in a cavity of the corresponding female elements;[[,]]

said method comprising:

~~wherein~~ performing an axial movement with working chambers that are formed between the female and/or male elements upon rotary motion of the male and/or female elements;~~, working chambers which are formed between the female and male elements perform an axial movement,~~ and

~~wherein~~ synchronizing the rotary motions of the different sets ~~(1, 2, 3) are synchronized~~ in such a manner that synchronous and in-phase motion of the elements in different sets ~~(1, 2, 3)~~ is performed with different values of angular periods of oscillation of axial movement of said working chambers.

2. (Original) The method of claim 1, wherein the angular period decreases from one set to the next set, thereby having the working medium compressed.

3. (Original) The method of claim 1, wherein the angular period increases from one set to the next set, thereby having the working medium expanded.

4. (Currently amended) The method of ~~any of the proceeding claims~~ claim 1, using a hollow shaft ~~(4)~~ and the working medium passing therethrough as a means for synchronizing the rotary motions of the different sets ~~(1, 2, 3)~~.

5. (Currently amended) The method of ~~any of the proceeding claims~~ claim 1, wherein:

a first set ~~(1)~~ forms a differential kinematic mechanism having three degrees of freedom of a mechanical rotation of which two degrees of freedom are independent;[[,]] and

~~wherein~~ a second set ~~(2)~~ forms a planetary kinematic mechanism, having two degrees of freedom of a mechanical rotation, of which one degree of freedom is independent.

6. (Currently amended) The method of ~~any of the proceeding claims~~ claim 1, wherein thermal energy of the working medium is removed and supplied in a heat exchanger.

7. (Currently amended) The method of ~~any of the proceeding claims~~ claim 1, wherein mechanical energy produced in one of said sets is used to drive another device.

8. (New) The method of claim 2, using a hollow shaft and the working medium passing therethrough as a means for synchronizing the rotary motions of the different sets.

9. (New) The method of claim 3, using a hollow shaft and the working medium passing therethrough as a means for synchronizing the rotary motions of the different sets.

10. (New) The method of claim 2, wherein:

a first set forms a differential kinematic mechanism having three degrees of freedom of a mechanical rotation of which two degrees of freedom are independent; and

a second set forms a planetary kinematic mechanism, having two degrees of freedom of a mechanical rotation, of which one degree of freedom is independent.

11. (New) The method of claim 3, wherein:

a first set forms a differential kinematic mechanism having three degrees of freedom of a mechanical rotation of which two degrees of freedom are independent; and

a second set forms a planetary kinematic mechanism, having two degrees of freedom of a mechanical rotation, of which one degree of freedom is independent.

12. New) The method of claim 4, wherein:

a first set forms a differential kinematic mechanism having three degrees of freedom of a mechanical rotation of which two degrees of freedom are independent; and

a second set forms a planetary kinematic mechanism, having two degrees of freedom of a mechanical rotation, of which one degree of freedom is independent.

13. (New) The method of claim 2, wherein thermal energy of the working medium is removed and supplied in a heat exchanger.

14. (New) The method of claim 3, wherein thermal energy of the working medium is removed and supplied in a heat exchanger.

15. (New) The method of claim 4, wherein thermal energy of the working medium is removed and supplied in a heat exchanger.

16. (New) The method of claim 5, wherein thermal energy of the working medium is removed and supplied in a heat exchanger.

17. (Currently amended) The method of claim 2, wherein mechanical energy produced in one of said sets is used to drive another device.

18. (Currently amended) The method of claim 3, wherein mechanical energy produced in one of said sets is used to drive another device.

19. (Currently amended) The method of claim 4, wherein mechanical energy produced in one of said sets is used to drive another device.

20. (Currently amended) The method of claim 5, wherein mechanical energy produced in one of said sets is used to drive another device.